7.0 SOIL RESOURCES RESPONSES

7.1 Appendix B (g)(15)(A)

Comment

Please provide a map at a scale of 1:24,000

Response

A map was included as Figure 8.9-1 in the AFC identifying the types of soils in the area. Descriptions of these soil types were provided in Section 8.9.1.2 on page 8.9-2. The project area is mainly industrial with no agricultural land uses. Therefore, no agricultural land will be affected by the MGS Project. Additional information is provided below regarding the soil types in the area and the effects on agricultural land uses. Figure 8.9-1 in the AFC is presented again as Figure 7-1 in color to better identify the soil types.

Two soil survey maps were prepared for the Los Angeles area in 1903 (Mesmer, 1903) and in 1919 (Nelson, et al, 1919). A “Report and General Soil Map for Los Angeles County” was also published in 1969 by the U. S. Department of Agriculture Soil Conservation Service (USDA, 1969). The small-scale map presented in this report shows that the soils in the site area are of either Hanford or Tujunga-Soboba series. The soil unit boundaries from this map, which should be considered approximate, were transferred to a 1:24000 topographic base map and are presented in Figure 7-1. The soil series north of the MGS site is Ramona-Placentia.

The Hanford soil series generally consists of deep, well-drained soils that formed in moderately coarse textured alluvium, dominantly from granite. Hanford soils are on stream bottoms, floodplains and alluvial fans and have slopes of 0 to 15 percent. A typical soil section for the upper 60-inches would be as follows:

> A1--0 to 12 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 4/3) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots in the upper few inches; many fine interstitial pores; slightly acid; gradual smooth boundary. (6 to 14 inches thick)
>
> C1--12 to 36 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common fine interstitial pores; neutral; diffuse boundary. (10 to 24 inches thick)

C2--36 to 60 inches; light yellowish brown (10YR 6/4) fine sandy loam and sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; slightly alkaline.

The Tujunga series consists of very deep, somewhat excessively drained soils formed in alluvium weathered mostly from granitic sources. Tujunga soils are on alluvial fans and flood plains and have slopes of 0 to 9 percent. A typical soil section for the upper 60-inches would be as follows:

C1--0 to 12 inches; pale brown (10YR 6/3) sand, brown (10YR 5/3) moist; single grained; loose; mica flakes evident; very low in organic matter; very porous; slightly acid; diffuse boundary. (6 to 14 inches thick)

C2--12 to 48 inches; similar to surface soil but of more variable color due largely to mineral grains themselves; diffuse boundary. (30 to 50 inches thick)

C3--48 to 60 inches; stratified sand, coarse sand and gravel; single grained; loose; neutral. (Many feet thick)

The Soboba series consists of deep, excessively drained soils that formed in alluvium from predominantly granitic rock sources. Soboba soils are on alluvial fans and flood plains and have slopes of 0 to 30 percent. A typical soil section for the upper 60-inches would be as follows:

A--0 to 11 inches; grayish brown (2.5Y 5/2) stony loamy sand, dark grayish brown (2.5Y 4/2) moist; single grained; loose, very friable; many medium and fine roots; many fine interstitial pores; neutral (pH 7.0); clear smooth boundary. (8 to 14 inches thick)

C--11 to 60 inches; grayish brown (2.5Y 5/2) stratified very gravelly and cobbly sand, sand, and loamy sand, somewhat lighter in color than the surface, dark grayish brown (2.5Y 4/2) moist; single grained; loose, very friable; common medium and fine roots; many fine interstitial pores; neutral (pH 6.8).

The natural soils at the site have largely been excavated and removed from the site or covered by past grading projects involved with the industrial and commercial development in the area. From an agricultural point-of-view, the soil resources are poor. The surrounding uses would effectively preclude any attempt to create an agricultural land use that would justify improving the soils. Thus, no agricultural land uses will be affected by the project.

7.2 Appendix B (g)(15)(A)(i)

Comment

Please provide the erosion hazard rating for the soil types.

Please provide the permeability, drainage, erosion hazard rating, and land capability class of the fill material.

<u>Response</u>

The soils at the site have been highly disturbed over the years since the area was subjected to industrial and commercial development, therefore the original soil profile described above for each unit may have been covered or partially to wholly removed. The 1923 survey and topographic map (USGS, 1924) show the site area to be occupied with scattered buildings. The topography appears to be generally natural with the site occupying a broad topographic low. The map indicates that the original project site elevation was about 188 feet. The current elevation is about 183 feet, indicating that several feet of original soil have been removed from the project site since that time. In addition, soil remediation has been conducted over much of the site area creating a thick (approximately 20 feet or more) artificial fill. This material is present over the majority of the project site.

The estimated permeability, drainage, erosion hazard rating, and land capability parameters for the soil (USDA, 1969) and fill are provided below in Table 7-1.

7.3 Appendix B (g)(15)(A)(ii)

<u>Comment</u>

Please provide an identification of other physical and chemical characteristics of the soil necessary to allow an evaluation of soil erodibility, permeability, re-vegetation potential, and cycling of pollutants in the soil- vegetation system for the fill material.

<u>Response</u>

The natural soils would have a relatively low susceptibility to wind erosion due to their coarse-grain size and relatively low susceptibility to water erosion due to the low surface slope (less than 5 percent). Runoff would be slow to very slow because of the high permeability. All of the soils vary from slightly acidic to slightly alkaline.

Fill soils are compacted to an average of 90 percent relative compaction and would have a greater density than the original site soils. The erosion susceptibility and permeability of these fill materials would be less than the natural soils.

There are no plans to re-vegetate the site other than to provide landscaping. The original soils would have provided reasonable re-vegetation characteristics. The use and vegetation characteristics of the local soils are as follows:

Hanford - Hanford soils are used for growing a wide range of fruits, vegetables, and general farm crops. They are also used for urban development and dairies. Vegetation in uncultivated areas is mainly annual grasses and associated herbaceous plants.

Tujunga – Tujunga soils are used mainly for grazing. Some areas used for growing citrus, grapes and other fruits. Uncultivated areas have a cover of shrubs, annual grasses and forbs.

Soboba - The soils are used mostly for pasture. The native vegetation is annual grasses and forbs, and chaparral shrubs.

7.4 Appendix B (g)(15)(C)(i)

Comment

Please provide the quantification of accelerated soil loss due to wind and water erosion (current, immediately upon completion of construction, and five years after completion).

Please provide a description of the areas where the soil from the site and linears will be deposited if it enters drainage ditches, pipes and canals.

Response

As shown in Drawing E-M4A-001-0 in Appendix B, the site is relatively flat with an estimated drainage slopes of less than 0.3 percent. About 61 percent of the site is covered with either packed sandy loam or gravel, and the remaining 39 percent of the site is impervious; consisting of an existing concrete building, asphalt concrete roadways, and parking areas. Based on these conditions, it has been estimated that 1.9 cubic yards of the sediments are currently lost to storm water runoff on an annual basis. This estimate indicates that the current sediment runoff is negligible. Additional details of the sediment runoff calculations are provided in Appendix B.

The City of Vernon has filed a Notice of Intent (NOI) with the State Water Resources Control Board on March 21, 2002 to obtain coverage under the *NPDES General Permit for Storm Water Discharges Associated with Construction Activity* (General Permit). In compliance with the General Permit, the City has also prepared draft Storm Water Pollution Prevention Plan (SWPPP). The SWPPP provides the details of the Best Management Practices (BMPs) that will be implemented when construction will be initiated to reduce or eliminate the sediment runoff during the construction phase. Figure 7-2 shows the anticipated drainage plan and layout of BMPs when construction will be initiated. BMP combinations of sandbags, silt fences, and asphalt berms (on the width of the site entrances) will be implemented to reduce or eliminate sediment runoff during the construction phase.

Figure 7-3 shows the anticipated ground cover of the site at the completion of construction. As indicated in this figure, the site will be covered with mostly asphalt/concrete and packed gravel with a small lawn area. The site grade will range between 0.6 percent and 2.5 percent slopes and will have an overall equivalent slope of approximately 0.8 percent. There will be no exposed soil areas. This anticipated design also meets the requirements of the local Standard Urban Stormwater Mitigation Plan (SUSMP) drainage requirements to promote onsite infiltration and inhibit sediment runoff. Based on this anticipated design, the site will experience no sediment runoff at completion of construction. With proper maintenance of the site BMPs associated with the future NPDES Permit associated with the facility operation, it is expected that no sediment runoff will occur five years after completion of construction. Please note that the City of Vernon has filed a NOI with the SWRCB on March 21, 2002 to obtain coverage under the Industrial Activities Storm Water NPDES General Permit. A draft Industrial SWPPP / Monitoring Program has also been prepared by the City for coverage under this General Permit.

Sediment barriers such as straw bales or silt fences slow runoff and trap sediments. Sediment barriers will be placed at the project site boundary preventing sediments from leaving the site. There are no drainage ditches or canals near or around the Project site; thus, soil is not expected to migrate from the Project site.

7.5 Appendix B (h)(1)(A)

Comment

Please provide tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, and permits (e.g. Clean Water Act, Porter-Cologne Water Quality Control Act, California Public Resources Code section 25523, etc.) applicable to the proposed project, and a discussion of the applicability of each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed

Response

The following LORS are applicable to protection of the soil resources and protection of surface water quality from project-induced erosion impacts. Table 7-2 provides a summary of these applicable LORS. As discussed below, the proposed project will be constructed and operated in accordance with applicable LORS and permit conditions.

Federal

The Federal Water Pollution Control Act of 1972; Clean Water Act of 1977 (including its 1987 amendments). These authorities establish requirements for any facility or activity that has or will discharge waste (including sediment due to accelerated erosion) that may interfere with the beneficial uses of receiving waters.

Administering Agency. The administering agency for the above authority is the Regional Water Quality Control Board (RWQCB), Los Angeles Region (4) under the direction of the State Water Resources Control Board (SWRCB).

U.S. Department of Agriculture, Soil Conservation Service (SCS), National Engineering Handbook (1983), Sections 2 and 3. The U.S. Department of Agriculture prescribes standards of technical excellence for the SCS, now called the Natural Resources Conservation Service (NRCS) for the planning, design, and construction of soil conservation practices.

Administering Agency. The administering agency for the above authority is the NRCS.

State

Cal. Public Resources Code § 25523(a); CCR §§ 1752, 1752.5, 2300 – 2309, and Chapter 2, Subchapter 5, Article 1, Appendix B, Part (i). The Act provides for protection of environmental quality. With respect to the MGS, the Act requires submittal of information to the CEC concerning potential environmental impacts, and the CEC's decision on the AFC must include consideration of environmental protection.

Administering Agency. The administering agency for the above authority is the CEC.

California Environmental Quality Act, Cal. Public Resources Code § 21000 et seq. ; Guidelines for Implementation of the California Environmental Quality Act of 1970, 14 CCR § 15000 – 15387, Appendix G. The CEQA guidelines specify that an impact may be considered significant from an agriculture and soil standpoint if the project results in: substantial soil erosion or loss of topsoil; degradation or loss of available agricultural land, agricultural activities, or agricultural land productivity in the project area; alteration of agricultural land characteristics due to plant air emissions; and/or conversion Prime or Unique farmland, or farmland of statewide importance, to nonagricultural use.

Administering Agency. The administering agency for the above authority is the CEC.

The California Porter-Cologne Water Quality Control Act of 1952; Cal. Water Code, § 13260 – 13269; 23 CCR Chapter 9. The code requires adequate protection of water quality by appropriate design, sizing and construction of erosion and sediment controls. Discharge of waste earthen material into surface waters resulting from land disturbance may require the filing of a report of waste discharge (Water Code § 13260(a)) and provides for the issuance of waste discharge requirements with respect to the discharge of any waste that can affect the quality of the waters of the state. Concerning potential surface water pollution from project area runoff, the waste discharge requirements may incorporate requirements based on the following source of recommended methods and procedures: California Regional Water Quality Control Board, 1996, Erosion and Sediment Control Field Manual.

Administering Agencies. The administering agencies for the above authority are the CEC, the RWQCB, the SWRCB, and the City's Department of Community Services & Water.

Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles, Order No. 96-054, NPDES No. CAS 614001. In accordance with the Clean Water Act, an NPDES permit is required for certain municipal separate storm water discharges to surface waters. The objective of the permit, and the associated storm water management program, is to effectively prohibit non-storm water discharges and to reduce pollutants in urban storm water discharges to the "maximum extent practicable" in order to attain water quality objectives and to protect the beneficial uses of receiving waters.

Administering Agency. The administering agency for the above authority is the RWQCB and City's Department of Community Services & Water.

Local

City of Vernon General Plan

The City requires a permit to grade the site.

Administering Agency. City of Vernon Department of Community Services & Water

Agencies and Agency Contacts

Agencies with jurisdiction to issue applicable permits and/or enforce LORS related to soils resources and agriculture are shown in Table 7-3.

Applicable Permits and Schedule

Table 7-4 lists all applicable permits for the MGS in the area of Agriculture and Soils. The Applicant will obtain any necessary grading permit or permits prior to beginning work that triggers such permit requirements, and will comply with all permit conditions.

Environmental Consequences

The environmental consequences of the MGS project are presented in Section 8.9.2 of the AFC.

Mitigation Measures

The mitigation measures for the MGS project are presented in Section 8.9.5 of the AFC.

7.6 Appendix B (h)(1)(B)

Comment

Please provide tables which identify each agency with jurisdiction to issue applicable permits and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.

Response

The City requires a permit to grade the site. A permit will be obtained for any grading required at the site. Additional information is provided in Tables 7-2 through 7-4.

7.7 Appendix B (h)(2)

Comment

Please provide a discussion of the conformity of the project with the requirements listed in subsection (h)(1)(A).

Response

The MGS project will conform to all LORS identified in Section 7.5 related to the protection of soil resources and surface water quality.

Federal Water Pollution Control Act of 1972; Clean Water Act of 1977

The anticipated soil loss due to erosion would be minimal (on the order of 0.1 tons per year). This is because much of the area is paved and the surrounding land uses provide wind breaks (buildings and other structures) and lined conveyances (drainage ditches, pipelines and canals) for water flow that limit the erosion and offsite transport of soil. Best management practices for soil excavation for foundations and pipeline trenching will be employed during the construction of the MGS. After construction, most of the area will be covered by either structures or pavement. The surface of the site will remain essentially flat and will be designed to resist significant wind and water erosion. The MGS is not expected to interfere with the beneficial uses of receiving water and therefore will be in compliance.

U.S. Department of Agriculture, Soil Conservation Service (SCS), National Engineering Handbook (1983), Sections 2 and 3

The site is located within a highly urbanized area of the City. There are no native soils exposed at the power plant site, which is completely covered with fill. There are no native soils present along the pipeline route, which is along and beneath a paved road. Due to the lack of native soils, soil conservation practices are not required.

Cal. Public Resources Code § 25523(a); CCR §§ 1752, 1752.5, 2300 – 2309, and Chapter 2, Subchapter 5, Article 1, Appendix B, Part (i)

The City, by participating in the AFC process, will be in compliance with the Cal. Public Resources Code regarding environmental quality. All information regarding potential impacts to environmental quality resulting from the MGS Project are presented in the AFC.

California Environmental Quality Act, Cal. Public Resources Code § 21000 et seq. ; Guidelines for Implementation of the California Environmental Quality Act of 1970, 14 CCR § 15000 – 15387, Appendix G

The MGS Project will not result in the substantial erosion or loss of topsoil. There are no agricultural activities in the area, nor will there likely be any in the future, therefore losses to agricultural lands, activity, or productivity are not expected to occur due to the proposed MGS. Air pollutant emissions from the MGS Project are discussed in detail in Section 8.1, Air Quality of the AFC. No air quality impacts were found which could significantly affect the soil characteristics of the MGS area.

The California Porter-Cologne Water Quality Control Act of 1952; Cal. Water Code, § 13260 – 13269; 23 CCR Chapter 9

Prior to construction, and as part of the grading plan permit requirements; the project will comply with the City of Vernon, Department of Community Services' Stormwater Program for Construction Activities. The program applies to activities on construction areas between two (2) and five (5) acres. The program requires the completion and submittal of a "Statement of Intent to Comply with Minimum Requirements of Stormwater Permit" to meet the standards of the Los Angeles County Municipal Stormwater Permit (CAS614001). These minimum standards include requirements for erosion control, sediment control, and construction activity control to be implemented at the project site. Further, and as required by the statement of intent, Best Management Practices (BMPs) must be implemented on the construction project in such a manner that:

- Sediments from disturbed soils must be retained on-site to the maximum extent practicable through the use of structural sediment controls.
- Erosion of disturbed soil must be minimized to the maximum extent practicable through the use of soil stabilization materials and procedures.
- All construction wastes must be managed in such a way that no wastes are either directly or indirectly discharged to the storm drain.
- All wash out from concrete trucks must be contained to prevent the rinse water discharge from entering the storm drain.

The required implementation of these BMPs will affirm protection of the waters of the State of California as promulgated by the Porter-Cologne Act.

Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles, Order No. 96-054, NPDES No. CAS 614001

As part of the municipal storm water program, the Regional Board adopted the Standard Urban Storm Water Mitigation Plan (SUSMP) to address storm water pollution from new development and redevelopment projects. The SUSMP is a model guidance document for use by Permittees in the review and approval of project plans to ensure that project proponents have adequately incorporated post-construction BMPs to manage the quality of storm water and urban runoff.

The loss of soils due to erosion and storms are expected to be minimal. This loss is not expected to affect the quality of surface waters due to storm water discharges. The MGS will file an NOI with the RWQCB, in lieu of obtaining an NPDES general permit, prior to any waste discharge as discussed in Section 8.14, Water Resources, of the AFC. Acceptance of the NOI by the RWQCB will indicate that the MGS is in compliance with all RWQCB regulations.

City of Vernon General Plan

A permit will be obtained for any grading required at the site. The City does not expect to require a grading permit for this project.

7.8 Appendix B (h)(3)

<u>Comment</u>

Please provide the name, title, phone number and address, if known, of an official within each agency who will serve as a contact person for the agency.

Response

This information is provided in Table 7-3.

7.9 §2022 (b)(1)(A)

Comment

Please provide a list of such standards, ordinances, and laws.

Response

Please see the response in Section 7.5.

7.10 §2022 (b)(1)(B)

Comment

Please provide substantial evidence and information demonstrating that the project as proposed in the application will comply with all standards, ordinances, and laws applicable at the time of certification.

Response

Please see the response in Section 7.5.

7.11 §2022 (b)(1)(C)

Comment

Please provide a discussion of expected changes to LORS.

Response

No LORS pertaining to agriculture and soils resources are anticipated to change between the time of filing an application and certification by CEC. However, should changes to LORS occur, the City of Vernon will take appropriate actions to ensure that the MGS will be in compliance with the changes.

7.12 §2022 (b)(1)(D)

Comment

Please provide a list of the requirements for permitting by each federal, state, regional, and local agency that has jurisdiction over the proposed project or that would have jurisdiction, but for the exclusive jurisdiction of the commission, and the information necessary to meet those requirements.

Response

The City requires a permit to grade the site. A permit will be obtained for any grading required at the site.

7.13 References

USDA, 1969, Report of General Soil Map for Los Angeles County.

Kleinfelder Associates, 2001, Report of Geotechnical Investigation Proposed Generating Units Vernon Power Station Facility, 2715 East 50th Street, Vernon, California, Project No. 58-9745-01, dated October 16, 2001, Revised December 7, 2001.

Lowney Associates, 2002, Site-Specific Seismic Review, Malburg 134 MW Power Plant, 2715 East 50th Street, Vernon, California, dated February 22, 2002.

Table 7-1
Estimated Permeability, Drainage, Erosion Hazard Rating, and Land Capability Parameters for the Soil

Soil Or Fill	Depth (Nominal)	Texture	Permeability	Drainage	Soil Hazard Rating	Land Capability Class
Hanford Series	60-inches	Coarse	High	Moderately rapid	Slight	I
Tujunga-Soboba Series	60-inches	Coarse to very coarse	High	Rapid to very rapid	Slight to moderate (wind)	II
Artificial Fill	0 to 30 feet	Medium to coarse	Low to moderate	Slow to moderately rapid	Slight	I

Table 7-2
LORS Applicable to Soil Resources & Agriculture

LORS	Applicability	Conformance
Federal		
Water Pollution Control Act of 1972; Clean Water Act of 1977	Establishes requirements for any facility or activity that has or will discharge waste (including sediment due to accelerated erosion) that may interfere with the beneficial uses of receiving waters.	Section 8.9.2 of the AFC
U.S. Department of Agriculture, Soil Conservation Service (SCS), *National Engineering Handbook (1983)*, Sections 2 and 3	Planning, design, and construction of soil conservation practices.	Section 7.5
State		
Cal. Public Resources Code § 25523(a); CCR §§ 1752, 1752.5, 2300 – 2309, and Chapter 2, Subchapter 5, Article 1, Appendix B, Part (i)	Protection of environmental quality.	Entire AFC and AFC Process
California Environmental Quality Act, Cal. Public Resources Code § 21000 *et seq.* ; Guidelines for Implementation of the California Environmental Quality Act of 1970, 14 CCR § 15000 – 15387, Appendix G	An impact may be considered significant from an agriculture and soil standpoint if the project results in: substantial soil erosion or loss of topsoil; degradation or loss of available agricultural land, agricultural activities, or agricultural land productivity in the project area; alteration of agricultural land characteristics due to plant air emissions; and/or conversion prime or unique farmland, or farmland of statewide importance, to nonagricultural use.	Section 7.5
Water Quality Control Act of 1952; Cal. Water Code, § 13260-13269 ; 23 CCR Chapter 9	Requires adequate protection of water quality by appropriate design, sizing and construction of erosion and sediment controls.	Section 7.5
Water Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles; Order No. 96-054; NPDES No. CAS 614001	Objective of the permit is to effectively prohibit non-storm water discharges and to reduce pollutants in urban storm water discharges through the SUSMP.	Section 7.5 and Section 8.14 of the AFC
Local		
City of Vernon	Establishes grading requirements during construction phase.	Section 8.9.6.3

Table 7-3
Agency Contacts

Agency	Contact	Title	Telephone
Regional Water Quality Control Board	n/a	n/a	n/a
Natural Resources Conservation Service	n/a	n/a	n/a
California Energy Commission	Bill Pfanner James W. Reeded, Jr.	Project Manager	(916) 654-4206 (916) 653-1245
City of Vernon Department of Community Services & Water	Pepe Reynoso	Code Enforcement Officer	(323) 583-8811
County Sanitation District of Los Angeles County	Suzanne S. Wienke	Supervising Civil Engineer	(562) 699-7411

Table 7-4
Applicable Permits

Jurisdiction	Potential Permit Requirements
Federal	• No federal permits were identified
State	• NOI in lieu of NPDES permit.
Local	• Grading Permit from City of Vernon Building Department

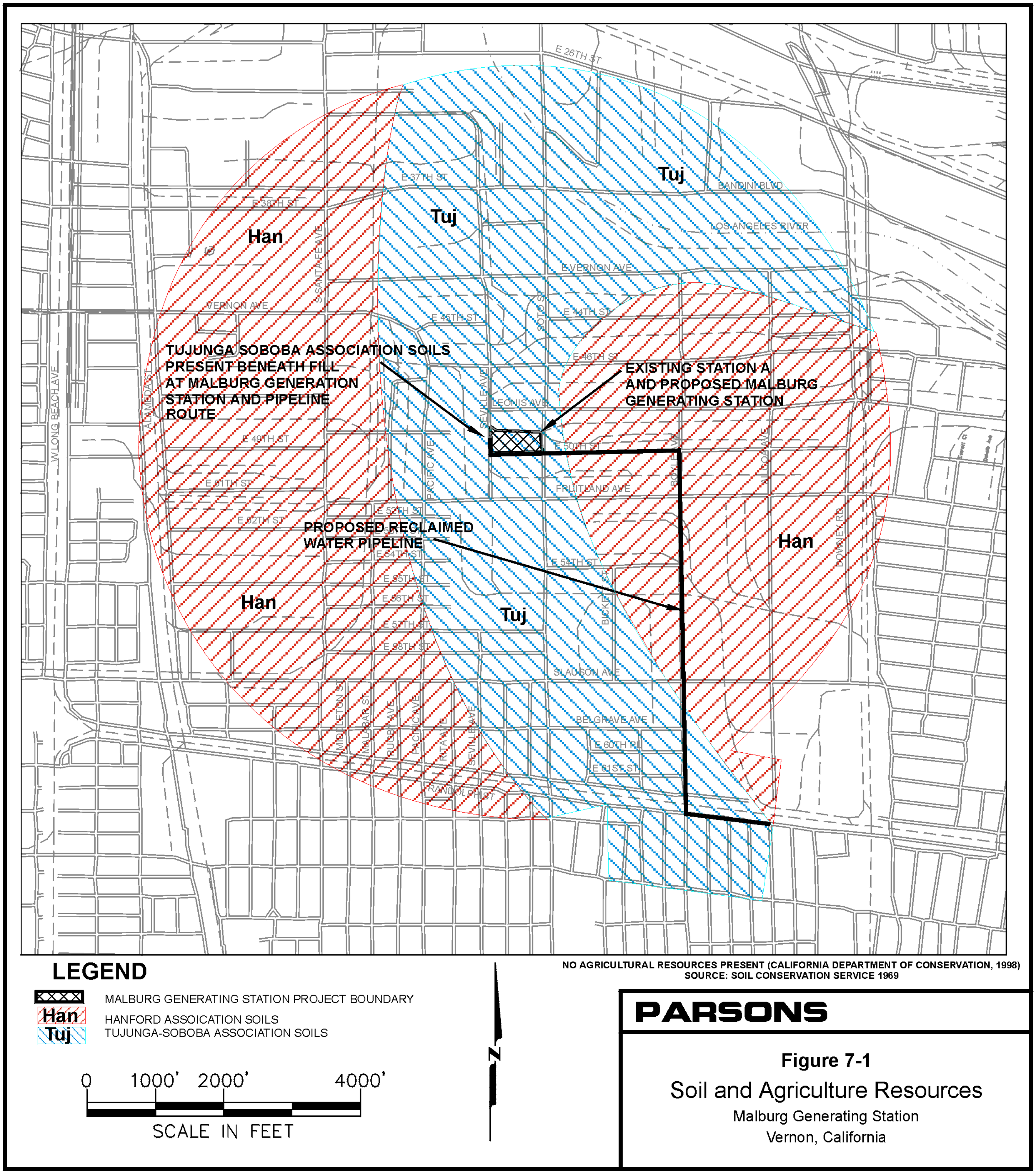
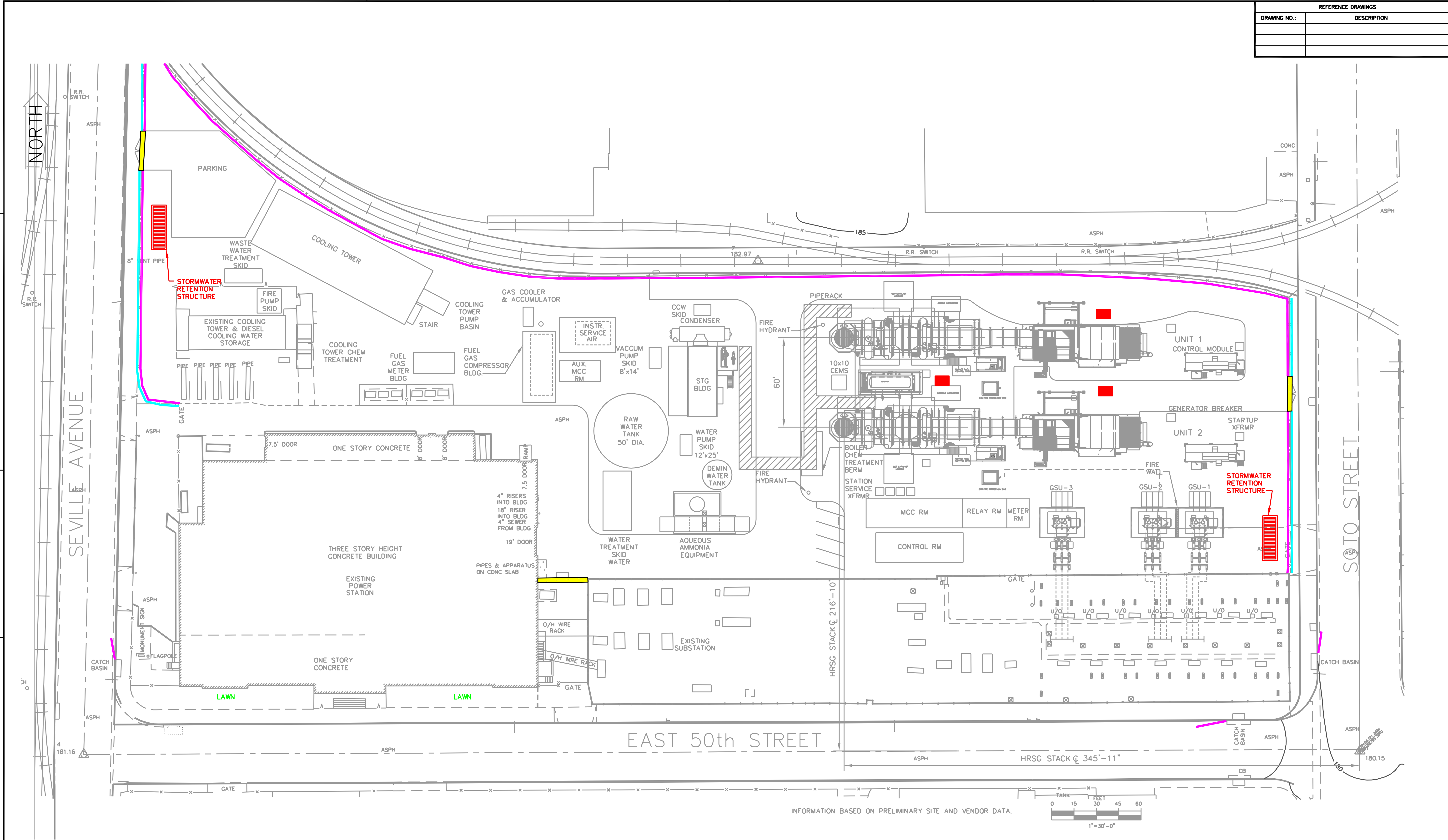


Figure 7-1
Soil and Agriculture Resources
Malburg Generating Station
Vernon, California



No.	DESCRIPTION	BY	CHKD	APPVD.	DATE
	REVISION				

No.	DESCRIPTION	BY	CHKD	APPVD.	DATE
0	ISSUED FOR PERMIT				
	REVISION				

Sand Bags – 2 Sand Bags High
Silt Fence
Asphalt Berm ~ 3" High

CONSTRUCTION ISSUE		
DISCIPLINE	BY	DATE
DRAWN:	TDC	
CHECKED:		
ENGINEER:		
LEAD ENGINEER:		
PROJECT ENGINEER:		
PROJECT MANAGER:		

DRAWING STATUS				
STATUS	REV	DATE	SDE	PEM
PERMIT APP.	0	11/20		

NOT APPROVED FOR CONSTRUCTION UNLESS SIGNED & DATED. DESTROY ALL PRINTS BEARING EARLIER DATE &/OR REV. NO.

THE INFORMATION HEREON IS CONFIDENTIAL PROPERTY OF CARTER & BURGESS, INC., THIS INFORMATION MAY NOT BE REPRODUCED (BY PHOTOCOPY, ELECTRONIC, FASCIMILE, ETC.) OR DIVULGED WITHOUT THE WRITTEN PERMISSION OF CARTER & BURGESS, INC.

Carter::Burgess
CARTER & BURGESS, INC.

CUSTOMER JOB No.
CARTER & BURGESS, INC. JOB No. 070734

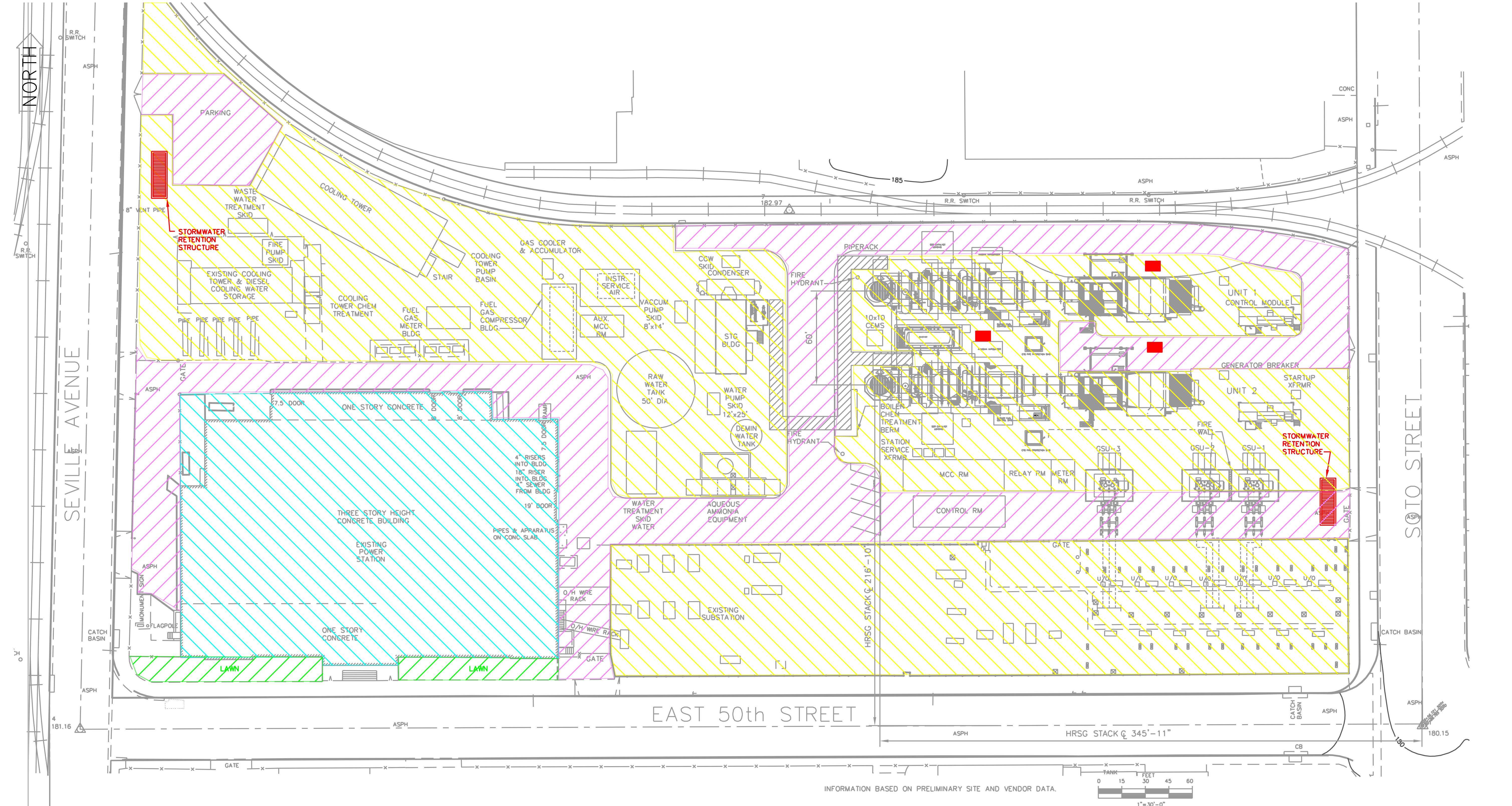
CITY OF VERNON 120 MW COMBINED CYCLE POWER PLANT STATION A VERNON CALIFORNIA

FIGURE 7–2

SITE MAP, ANTICIPATED DRAINAGE PLAN, AND LAYOUT OF BMPs

SCALE: 1"=30'-0" | DWG. No.: 070734DA–01 | REV. 0

REFERENCE DRAWINGS	
DRAWING NO.:	DESCRIPTION



No.	DESCRIPTION	BY	CHKD	APPVD.	DATE
REVISION					

GROUND COVER
- ASPHALT / CONCRETE
- GRAVEL
- LAWN
- BUILDING

No.	DESCRIPTION	BY	CHKD	APPVD.	DATE
0	ISSUED FOR PERMIT				
REVISION					

CONSTRUCTION ISSUE		
DISCIPLINE	BY	DATE
DRAWN:	TDC	
CHECKED:		
ENGINEER:		
LEAD ENGINEER:		
PROJECT ENGINEER:		
PROJECT MANAGER:		

DRAWING STATUS				
STATUS	REV	DATE	SDE	PEM
PERMIT APP.	0	11/20		

NOT APPROVED FOR CONSTRUCTION UNLESS SIGNED & DATED. DESTROY ALL PRINTS BEARING EARLIER DATE &/OR REV. NO.

THE INFORMATION HEREON IS CONFIDENTIAL PROPERTY OF CARTER & BURGESS, INC., THIS INFORMATION MAY NOT BE REPRODUCED (BY PHOTOCOPY, ELECTRONIC, FASCIMILE, ETC.) OR DIVULGED WITHOUT THE WRITTEN PERMISSION OF CARTER & BURGESS, INC.

Carter & Burgess
CARTER & BURGESS, INC.

CUSTOMER JOB No.
CARTER & BURGESS, INC. JOB No. 070734

CITY OF VERNON 120 MW COMBINED CYCLE POWER PLANT STATION A VERNON CALIFORNIA

FIGURE 7–3

GROUND COVER LAYOUT

SCALE: 1"=30'-0" | DWG. No.: 070734DA–01 | REV. 0

APPENDIX B

SEDIMENT RUNOFF CALCULATIONS

PARSONS	Job Number	Discipline	Sheet	of
Calculation Sheet	740774-01000	CIVIL	1	3

Rev	Date	By	Ck	Title
0	3/25/02	JV	TH	STATION A VERNON POWER PLANT Sediment Runoff calculation

1. PURPOSE:
To estimate the average annual soil loss from susceptible soil erosion during construction of proposed 120MW Combined Cycle Power Plant in the City of Vernon

2. REFERENCE:
2.1 Guidelines for the Use of the Revised Universal Soil Loss Equation (RUSLE) version 1.06 on Mined Lands, Construction Sites, and Reclaimed Lands, August 1998
2.2 RUSLE computer program version 1.06 (to compute factor values in equation below)
2.3 ALTA/ACSM Land Title Survey, Irby & Associate, Inc.
2.4 Anticipated Drainage Plan, Carter & Burgess, Inc., drawing No. 070734DA-01
2.5 Normal Monthly Precipitation data from website: http://lwf.ncdc.noaa.gov/oa/climate/online/ccd/nrmlprcp.html

3. METHOD:

The Revised Universal Soil Loss Equation used to predict soil loss is as follow:

A = R*K*LS*C*P

Where

A = average annual soil loss in tons per acre
R = rainfall-runoff erosivity factor
K = soil erodibility factor
L = slope length factor
S = slope steepness factor
C = cover-management factor
P = support practice factor

a. Determine R factor

Using RUSLE computer program, among the locations with available climate information, San Diego is geographically located closer to City of Vernon than any other cities and it has the highest R- value compared to any other cities in Southern California. Therefore, San Diego was chosen for R factor calculation. In addition, this R-value will be adjusted to reflect simulated scenario based on the precipitation ratio compared to cities in the Los Angeles area.
Normal Monthly Precipitation data from reference 2.5 shows the annual precipitation gives a ratio of approximately 1.5:1 between Los Angeles and San Diego. Based on this ratio, it's reasonable to assume that R factor of Vernon is 1.5 times that of San Diego. The RUSLE computer program gives an R factor value of 20 for San Diego. This value will now be adjusted to 30 for City of Vernon.

Sediment.doc 03/26/2002

PARSONS	Job Number	Discipline	Sheet	of
Calculation Sheet	740774-01000	CIVIL	2	3

Rev	Date	By	Ck	Title
0	3/25/02	JV	TH	STATION A VERNON POWER PLANT Sediment Runoff calculation

b. Determine K factor

With the soil type of sandy loam, the soil is assumed to behave like medium-textured soil with K value of approximately 0.45. Refer to p 3-1 of Reference 2.1. This K value was input to RUSLE program as the estimated K. The other parameters input for K value calculation were:

Percent of rock cover = 0 %

Number of years to consolidate was calculated by program based on the rainfall for San Diego city, # years = 20 years

Hydrologic group, assumed to be moderately high runoff potential

Computer program gives the output value of K = 0.45 as estimated. Therefore, the initial estimated K value is valid.

c. Determine LS factor

By using reference 2.4 as a guide to calculate the soil loss during construction period, the site is divided into two areas for drainage grading. The effect of slope steepness on erosion, or slope length factor, LS, is also calculated for the two separate areas. The length and gradient of segments refer to the length and slope of drainage swales in those areas. Table 1 below summarizes the calculations.

Table 1. LS factor summary

	Area 1 (west side drains towards Seville Avenue)		**Area 2 (east side drains towards Soto Street)**	
	gradient	length (ft)	gradient	length (ft)
segment 1	2.50%	100	0.60%	405
segment 2	0.60%	400	0.60%	403
equivalent slope	0.84%		0.60%	
overall area LS	0.162		0.122	

d. Determine C factor

C factor indicates how the soil-loss potential is distributed in time during construction activities. Since this site is under the "fill" condition, C value is assumed to be 1, which is the value of the bare soil at the construction site, under packed & smooth filling condition. The value of 1 is assumed conservatively for the worst case of highest erosion rate. Refer to Table 5-3 of Reference 2.1

e. Determine P factor

P factor reflects the impact of barrier structures in minimizing the transportation of

Sediment.doc 03/26/2002

PARSONS	Job Number	Discipline	Sheet	of
Calculation Sheet	740774-01000	CIVIL	3	3

Rev	Date	By	Ck	Title
0	3/25/02	JV	TH	STATION A VERNON POWER PLANT Sediment Runoff calculation

sediment. Since the site is constructed for industrial use, no barrier ridge is there, P can be assumed to be 1, which is the most conservative case for very low ridge height in nearly bare and high runoff potential soil, table 6-3 of Reference 2.1.

4. CALCULATIONS AND RESULTS:

Plugging the factors determined above into equation A = R*K*LS*C*P, the amount of soil loss is calculated and shown in Table 2 below:

Table 2. Summary of Predicted Average Annual Soil Loss

	R	K	LS	C	P	A (tons/ acres)
Area 1 (West side)	30	0.45	0.162	1	1	2.187
Area 2 (East side)	30	0.45	0.122	1	1	1.647
The whole site						**3.834**

Assuming the soil has the density of 125 lb/ft^3, the volume of soil loss per year is shown in Table 3 below:

Table 3. Volume of Soil Loss Annually for New Site

	Area (acres)	soil loss (tons/acre)	volume of soil loss (yd^3)
Area 1 (West side)	1.4	2.187	**1.8**
Area 2 (East side)	2	1.647	**2.0**
Entire Site	3.4		**3.8**

5. CHECK SOIL LOSS OF EXISTING SITE

By using reference 2.3 as a guide to calculate soil loss of the existing site and using the same methodology and assumption, the volume of soil loss is shown in Table 4 below:

Table 4. Volume of soil loss annually for existing site

	segment length (ft)	slope (%)	R	K	LS	C	P	A	area (acres)	volume of soil loss (yd^3)
Existing site - 1 segment	750	0.3	30	0.45	0.0712	1	1	0.9612	3.4	**1.9**

Sediment.doc 03/26/2002

Table 6-3. P values for contour furrowing on a 300 ft hillslope with a 10% gradient at Lexington, Kentucky and hydrologic soil group D (very high runoff potential). WORST CASE IN LA. AREAS USE P = 1 ALSO.

Ridge Height (inches)	About 50% Cover	Nearly Bare Soil
Very low (0.5-2)	1.00	1.00
Moderate (3-4)	0.70	0.95
Very high (>6)	0.41	0.89

Table 6-4. P values for contour furrowing on a 300 ft hillslope with a 10% gradient at Denver, Colorado and hydrologic soil group B (moderate runoff potential).

Ridge Height (inches)	About 50% Cover	Nearly Bare Soil
Very low (0.5-2)	0.66	0.66
Moderate (3-4)	0.42	0.42
Very high (>6)	0.35	0.35

The RUSLE program is to be used to generate P values appropriate to a specific site. The values presented in **Tables 6-1 to 6-4** are intended to illustrate the effects of ridge height, percent cover, hydrologic properties of soils, and climate on P values at Lexington, Kentucky and Denver, Colorado. **Tables 6-1, 6- 2, and 6-3** illustrate how the effectiveness of contour furrows decrease from a soil with low runoff potential (high infiltration) to a soil with moderate or very high runoff potential (slow infiltration). **Tables 6-2 and 6-4** show climate to be an important consideration when assigning P values.

The effectiveness of contour furrowing varies considerably with climate conditions.

Lastly, note that values in **Table 6-1**, Column 1 and **Table 6- 4**, Columns 1 and 2 are all identical. These values represent minimum P values for contouring within RUSLE. Once these values are achieved, further management to control erosion must occur in other ways, such as modification of hillslope shape, terracing, or changes to decrease the C value.

When tillage operations are very carefully placed on the contour, use "*zero*" for the furrow grade. When buffer strips and strips of close-growing vegetation are used, use a ratio of furrow grade to land gradient of 0.05. For example, if the land is 10 percent in gradient, use a furrow grade of 0.5 percent. When tillage operations are performed without carefully laying out contour lines, but an effort is made to stay on the contour (much as would be done for a farm field), use a ratio of furrow grade to land gradient of 0.1. Namely, use a furrow grade of 1 percent for a land gradient of 10 percent.

6-5

REF. 2.1

The C values in **Table 5-3** were computed for a site near Lexington, KY assuming that the operation occurred on March 15. The C values are for the first three months following the operation. The C values of the "fill" practices are due almost entirely from the random roughness resulting from fill placement. There is some loss of roughness during the three months caused by erosion of the microtopographic peaks and sedimentation in the microtopographic basins.

No soil disturbing activity is assumed for the "cut" practices. The C value of 0.45 is based on the assumption in RUSLE that a consolidated soil is about 45% as erodible as a freshly disturbed soil. The difference between the value of 0.45 and the other C values for the "cut" conditions reflect the effect of "dead" root biomass on soil-loss rates. The density of the root system and biomass for the sod is assumed to be much greater than for the "weeds." These differences are taken into account in the RUSLE program.

Table 5-3. C values for bare soil at construction site

Condition	Practice	Factor
Fill	Packed, smooth	1
	Freshly disked	0.95
	Rough (Offset disk)	0.85
Cut	Below root zone	0.45
	Scalped surface (some roots remain from sod)	0.15
	Scalped surface (some roots remain from weeds)	0.42

After the mining or construction activity is completed, the reclamation process usually begins. Along with the application of mulch, permanent vegetation often is established by seeding. The effectiveness of the vegetative cover in reducing soil loss increases through time as the stand develops. **Table 5-4** provides some typical C values for different types and growth stages of vegetative cover. Once again, because of the interactive nature of the variables in RUSLE, the program always should be used to compute C values for specific applications; the values in **Table 5-4** are intended only as examples. Small grain cover crops (nurse crops) give quick cover and help to protect the soil until the permanent vegetation is established. Even weeds give some protection. Any type of cover will help protect the soil from the erosive forces of rainfall and runoff.

The C values in **Table 5-4** were computed for a site near Lexington, KY. The C values illustrate the difference in the effect on soil-loss rates of a cover crop, such as oats,

5-13

REF. 2.1

CHAPTER THREE

K Factor: Soil Erodibility

Author: G. A. Weesies
Technical Resource: W. F. Kuenstler, G. W. Wendt, G.R. Foster

What K Represents

The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. The standard condition is the unit plot, 72.6 ft long with a 9 percent gradient, maintained in continuous fallow, tilled up and down the hillslope. K values reflect the rate of soil loss per rainfall-runoff (R) erosion index [ton acre h(hundreds of acre foot tonf in)$^{-1}$]. Hereafter, the term "soil" is used in the broad context to include true soils and other surface materials serving as a plant-growth medium, sometimes referred to as soil substitute, resoil material, or other such terms.

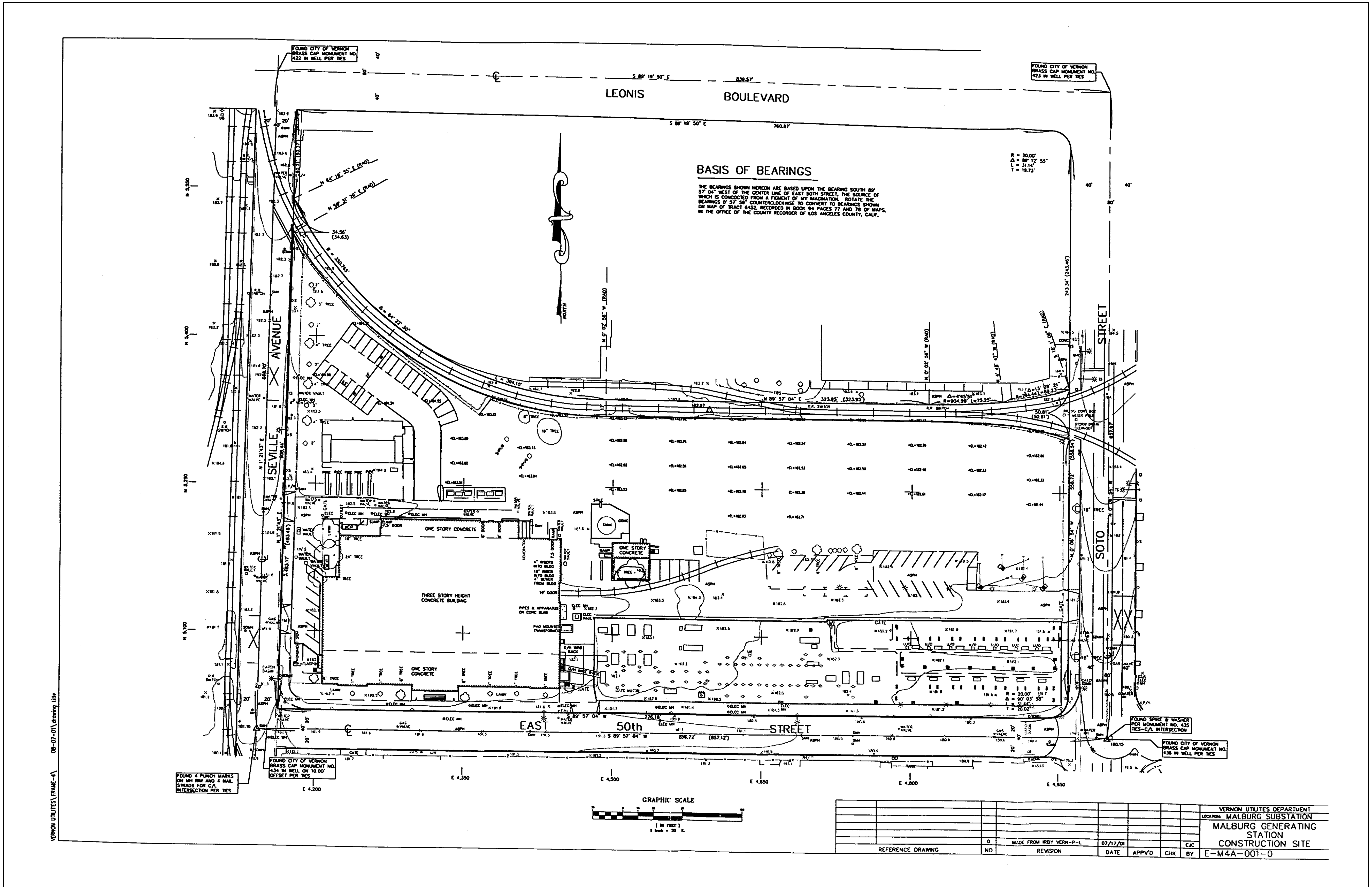
RUSLE requires an initial K value that is based on soil properties. This value is either hand-entered or computed using the soil-erodibility nomograph equations in RUSLE. For the eastern two-thirds of the United States, RUSLE then computes an adjusted K value based on the seasonal variation of climate.

When the soil properties are the same at two locations, the initial K is the same for both locations, but the adjusted K (the one used in the RUSLE soil-loss calculations) may be different between the two locations due to the differences in climate. Therefore, the RUSLE program should be used to compute the K value for each location rather than simply hand-entering an initial K value in the RUSLE "Soil Loss and Sediment Yield Computation Worksheet" screen.

Relationship of K Factor to Soil Properties

Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45

REF. 2.1


LEONIS BOULEVARD
BASIS OF BEARINGS
SEVILLE AVENUE
SOTO STREET
EAST 50th STREET
THREE STORY HEIGHT CONCRETE BUILDING
ONE STORY CONCRETE
GRAPHIC SCALE
VERNON UTILITIES DEPARTMENT
MALBURG SUBSTATION
MALBURG GENERATING STATION CONSTRUCTION SITE
E-M4A-001-0
REFERENCE DRAWING
REVISION
DATE
NO